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(71) Applicant  
Horizon International Inc. (Japan),  
1601 Aza Shironoshita, Ooaza Asahi, Shin-Asahicho,  
Takashima-gun, Shiga, Japan

(72) Inventor  
Kouji Oishi

(74) Agent and/or Address for Service  
F. J. Cleveland & Company,  
40-43 Chancery Lane, London WC2A 1JQ

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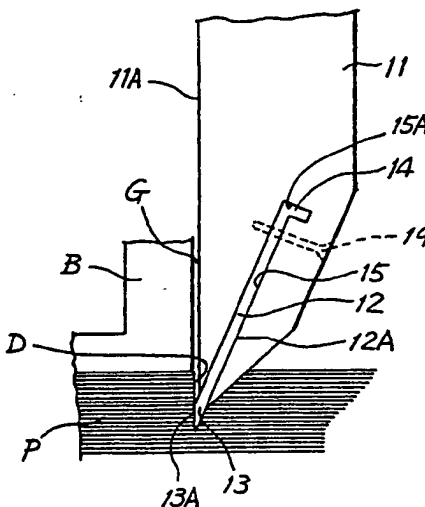
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(58) Field of search  
B4B

## (54) Cutting device

(57) A device for cutting piled sheets of paper or the like P, which comprises a holder 11 provided with a groove 15 and a blade 12 inserted into the groove to be held by the holder. The holder is movable perpendicularly to the piled sheets of paper and the blade has an edge 13 defined between an inclined surface 13a of the blade and one side surface 12a thereof. The groove is inclined relative to one side surface 11a of the holder. The blade is inserted into the groove removably therefrom so that the inclined edge surface of the blade is in parallel with and projects from said one side surface 11a of the holder which stands perpendicular to the piled sheets of paper to be cut.

Fig. 5



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Fig. 1

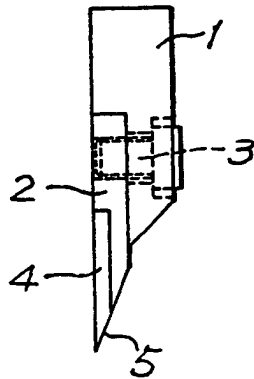


Fig. 2

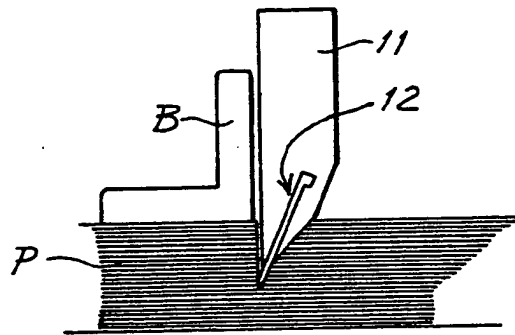


Fig. 3

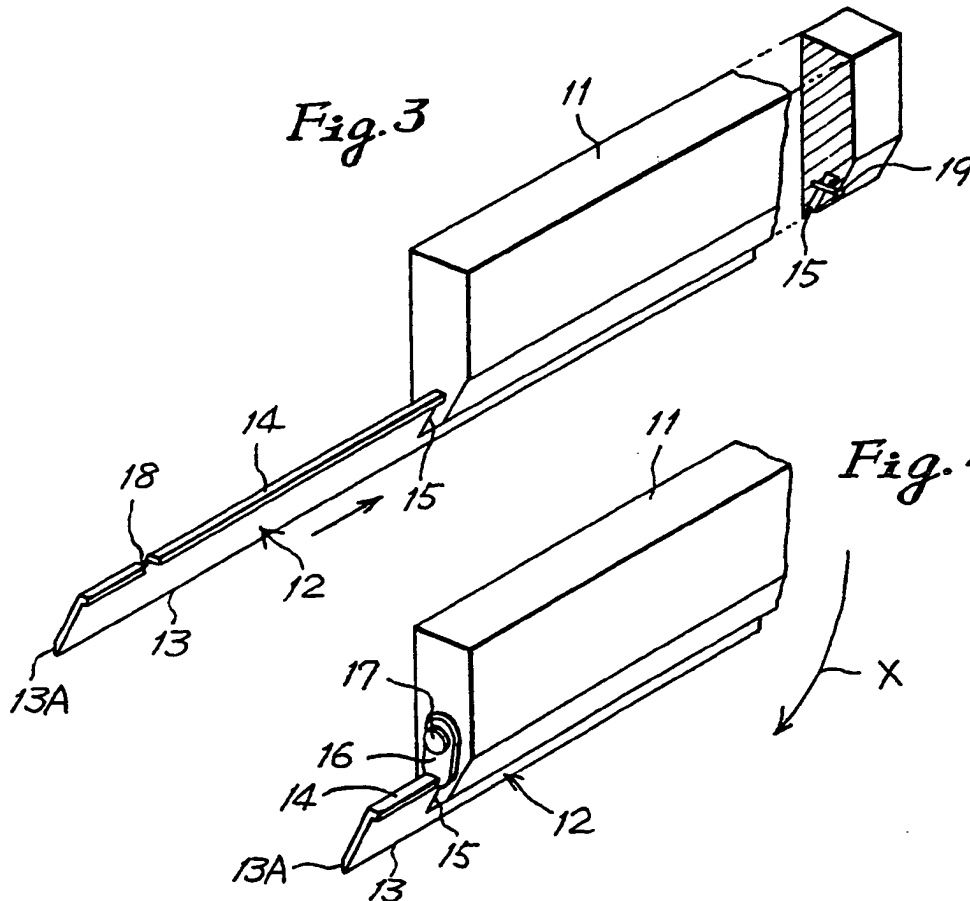
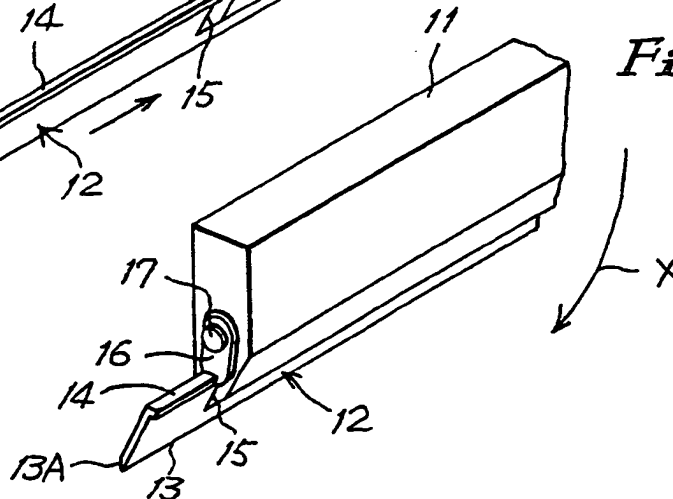


Fig. 4





## SPECIFICATION

## Cutting device

5 This invention relates to a device for cutting piled sheets of paper or the like.

One known cutting device of this type is shown in Figure 1 comprising a holder 1, a base 2 of ordinary steel fixed to the holder 1 by screws only one of which is shown at 3 and a blade 4 fixed to the base plate 2 by brazing. With this arrangement, when the edge of the blade has been worn out, it can conveniently be replaced by a new blade by simply unfastening the screws. Since the blade is made of high speed steel, it is extremely difficult to make a threaded bore in the blade or otherwise machine it, so that the blade is fixed to the base plate by brazing. With this arrangement, however, it takes time to unfasten and fasten the screws for replacement of the worn blade by a new one. Moreover, the base plate not only adds to the manufacturing cost of the cutter but also makes the structure thereof the more complex.

Accordingly, the primary object of the invention is to provide a cutting device which is simple in construction and easy to manufacture.

Another object of the invention is to provide such a cutting device as aforesaid in which the blade can be easily removed from the holder for repair or replacement.

The invention will be described in detail with reference to the accompanying drawing.

*Brief description of the drawing*

35 *Figure 1* is a somewhat schematic end view of a conventional cutting device for cutting piled sheets of paper;

*Figure 2* is a similar end view of a cutting device in one embodiment of the invention;

40 *Figure 3* is a perspective view of the cutting device, showing the manner in which the blade is inserted into the groove of the holder;

*Figure 4* is a perspective view of the cutting device, showing the blade inserted into the groove of the holder with a member for preventing the blade from being inadvertently pulled out of the groove;

*Figure 5* shows an enlarged end view of the cutting device as it is cutting piled sheets of paper; and

50 *Figure 6* is a view for explaining the operation of the cutting blade.

*Summary of the invention*

Briefly stated, the cutting device of the invention comprises a holder formed with a groove which is inclined relative to one side surface of the holder and extends longitudinally thereof from an open end at one end surface of the holder. The holder is movable relative to an object to be cut and in a plane parallel with the above-mentioned one side surface of the holder. The cutting device further comprises a cutting blade which has an edge defined between an inclined surface of the blade and one side surface thereof. The blade is inserted into the groove of the holder removably therefrom so that the inclined

edge surface of the blade lies in parallel with the above-mentioned one side surface of the holder as well as with the plane in which the holder is movable.

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*Description of a preferred embodiment*

Referring to Figures 2 to 5, there is shown a holder 11, to which a blade 12 is directly fixed without any intervening member such as the conventional base plate 2 shown in Figure 1. The blade 12 is made of high speed steel. The blade 12 has an edge 13 and a back 14 which is bent substantially perpendicularly to the plane of the blade.

The blade 12 is fixed to the holder 11 in such a manner that when the blade is moved to cut piled sheets of paper P, the inclined surface 13A of the edge 13 of the blade 12 stands substantially perpendicular to the plane of the sheets of paper P as shown in Figure 5. In other words, the blade 12 is fixed to the holder 11, with the plane of the blade being inclined relative to the plane of the holder, so that the inclined surface 13A of the blade edge is in parallel with one side surface 11A of the holder 11.

To fix the blade to the holder in the above-mentioned manner, the holder 11 is formed with a groove 15 which is inclined relative to the side surface 11A of the holder and extends longitudinally of the holder. The cross-sectional shape of the groove 15 substantially conforms to that of the blade 12 except the edge portion 13 thereof.

To fix the blade 12 to the holder 11 the blade 12 may be inserted into the groove 15 from one end of the holder. If the groove 15 extends the whole length of the holder, the holder may be provided with a stopper 19 in the form of a screw or a pin crossing the groove 15 adjacent the opposite end of the holder, so that the inner end of the blade inserted into the groove 15 hits against the stopper, which prevents farther insertion of the blade into the groove. To prevent the blade that has been inserted into the groove from slipping out of the groove, the holder may be provided with a tongue 16 pivoted by a pin 17 to one end surface of the holder and the cutter blade may be provided with a notch 18 formed in the back of the blade adjacent the corresponding end thereof, so that when the blade has been inserted a predetermined length into the groove 15 of the holder, the tongue 16 is brought into engagement in the notch 18 of the blade thereby to prevent the blade from being inadvertently pulled out of the groove. When the blade is to be replaced by a new blade, it is simply pulled out of the groove so that a new blade is inserted into the groove as previously mentioned.

As can be seen from Figure 5, the inclined surface 13A of the edge 13 of the blade 12 is offset or projects slightly to the left side in Figure 5 from the side surface 11A of the holder 11, so that when the blade cuts piled sheets of paper P with a member B pressing the sheets, a small gap G is formed between the cut end surface D of the sheets and the side surface 11A of the holder 11. The gap G helps prevent frictional contact between the two surfaces D and 11A as the holder 11 is moved down for the blade 12 to cut the sheets, so that the holder 11 can

be driven for cutting by a smaller force than if there was frictional contact between the two surfaces.

The blade 12 cutting the sheets of paper P receives a counterforce one component F1 of which acts in the direction of the inclined surface 13A of the blade edge 13 as shown in Figure 6. Another component F2 of the counterforce is borne by the portion 15A of the inner surface of the groove 15 against which the back 14 of the blade 12 is pressed, so that the blade 12 can be made as thin as, for example, 1 mm to 1.5 mm without any trouble or inconvenience.

Although the blade 12 is simply inserted into the groove 15 of the holder 11, for cutting the holder 11 descends not vertically but aslant as shown by the arrow X in Figure 4, so that as the holder descends, the counterforce from the sheets of paper P presses the blade 12 against the inner surface of the groove 15 of the holder 11 as well as the stopper 19 in the groove thereby to prevent the blade from sliding out of the groove.

As can be easily seen from Figures 1 and 2 or 5, the inclined surface 13A of the blade 12 in Figure 2 faces in the opposite direction to that in which the inclined surface of the blade in Figure 1 faces. If the blade 12 in Figure 2 was so held as to face in the same direction as the blade in Figure 1 and inserted into the groove 15, the side surface 12A of the blade 12 could not stand perpendicular to the piled sheets of paper. In accordance with the invention, however, since the blade 12 faces in the direction as illustrated and inserted into the inclined groove 15, the inclined surface 13A of the edge 13 of the blade stands perpendicular to the sheets of paper P so that it is possible to cut the piled sheets perpendicularly thereto.

In accordance with the invention, to mount the blade to or dismount it from the holder a simple operation of inserting the blade into or pulling it out of the groove in the holder suffices without the necessity of handling screws as in the conventional arrangement. The device of the invention comprises only two components, that is, a holder and a blade without the necessity of using the conventional base plate 2 and fixing the blade thereto by brazing. The device is simple in construction and low in manufacturing cost.

#### CLAIMS

1. A cutting device comprising a holder formed with a groove inclined relative to one side surface of said holder and extending longitudinally thereof from one open end at one end surface of said holder, said holder being movable relative to an object to be cut and in a plane parallel with said one side surface, and a cutting blade having an edge defined between an inclined surface and one side surface of said blade, said blade being removably inserted into said groove so that said inclined edge surface lies in parallel with said one side surface of said holder and said plane in which said holder is movable.

2. The device of claim 1, wherein said inclined edge surface of said blade is offset outwardly of said one side surface of said holder.

3. The device of claim 1, wherein said blade is

provided adjacent one end of the back thereof with a notch and said holder is provided at said one end surface with a member adapted for selective engagement in said notch to prevent said blade inserted into said groove of said holder from being inadvertently pulled out of said groove.

4. The device of claim 1, wherein said holder is provided with a stopper in said groove adjacent one end thereof so that said blade inserted into said groove is stopped by said stopper.

5. The device of claim 1, wherein said object to be cut comprises piled sheets of paper.

6. A device as claimed in claim 1 and substantially as herein described with reference to the accompanying drawings.

7. Each and every novel embodiment herein set forth either separately or in combination.

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